

ICESat-2 Mission: Status, Outlook, and Contributions to Polar Science

Thomas Neumann, NASA/GSFC, Code 615, Cryospheric Sciences Laboratory, Greenbelt, MD

ABSTRACT

The Ice, Cloud and land Elevation Satellite-2 (ICESat-2) mission carries the Advanced Topographic Laser Altimeter System (ATLAS) lidar to measure the changing height of Earth surface. After more than 3 years of science data collection, ATLAS has emitted well over a trillion laser pulses and continues to operate nominally. The ICESat-2 data products were initially released in May 2019, and have been used in over 150 peer-reviewed publications to date. Recent community white papers have noted the importance of ice elevation measurements for the coming decades, and as CryoSat-2 has entered its second decade and future missions are uncertain, ICESat-2 will be a critical part of the Earth System Observatory for the 2020s. In the polar regions, ICESat-2 has enabled year-round sea ice freeboard measurements as well as ice sheet elevation changes on seasonal, annual, and decadal time scales when combined with other missions. These data enable measurement of change at fine spatial and temporal scales to help understand or characterize the processes driving these observations.

As of this presentation, Release 005 is the current version of the along-track data products, including surface-specific products for sea ice, land ice, ground and canopy height, ocean, and inland water heights. In addition, first versions of gridded data products for land ice, sea ice, and ocean are all available. Data spans the start of the mission (14 October 2018) through early 2022. The ICESat-2 project has also begun to produce and distribute QuickLook products with a nominal 3-day latency (as opposed to the ~45-day latency of the final data products). Initial versions of these QuickLook products have elevation accuracy of ~3 meters, and geolocation accuracy of ~50 meters. All products are available through the National Snow and Ice Data Center (nsidc.org).

This presentation will summarize the current state and health of the observatory, current state of the ICESat-2 data products, data product quality assessment, and outlook for the future.